NEWS REPORT

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Aviation Psychology

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Chairman, Division of Anthropology and Psychology

AVIATION psychology originated in World War I. The lead in applying psychology to aviation was taken in France and Italy where centers for psychological work on aviation were established. Such centers were also established in Germany, England, and the United States. Most of these were under Government auspices and the emphasis in each center was on the selection of those best fitted for flight training.

The problem of selecting pilots was difficult because nobody knew very much about the qualifications of a good pilot. Job analysis which was just being introduced into industry was unknown in aviation. The need for a job analysis of flying was first recognized by Italian psychologists, who attempted a survey of "successful," "mediocre," and "unsuccessful" pilots. This analysis is of historical interest but, like many others of the same period, is of doubtful value.

The French psychologists were concerned primarily with simple reaction-time and physiological responses to emotional stimuli; the Germans emphasized perceptual and memory tasks; and the British, being eclectic, used a wide variety of tests but stressed none in particular. They were concerned principally with the maintenance of the flyer, rather than with selection and classification.

In the United States, the psychologists concentrated on measurement of reaction time, motor dexterity, judgment, attention, intelligence, association, personality, and several other items. Perhaps the chief contribution of American psychologists was their insistence upon trying out and validating the batteries of tests. They insisted upon controlled research of the tests as a prerequisite to using them.

At the request of Dean R. Brimhall of the Civil Aeronautics Administration (CAA), the Committee on Selection and Training of Civilian Aircraft Pilots was established within the Division of Anthropology and Psychology, National Research Council, in September 1939, with the late John G. Jenkins of the University of Maryland as chairman. On February 1, 1942, Dr. Jenkins resigned to accept a commission in the United States Naval Reserve and Morris S. Viteles, University of Pennsylvania, was appointed to succeed him.

Although the Committee was originally organized to undertake research in the selection, training, and maintenance of civilian pilots only, its functions were early expanded to include military as well as civilian aviation and in 1940 the word "civilian" was dropped from the Committee's name. In 1947 it became known as the Committee on Aviation Psychology.

The value of the Committee's early research program became apparent when the United States entered World War II in 1941. One of the immediate tasks was to produce aircraft pilots which required the selection of qualified candidates to receive intensive training. Fortunately, through the work of the Committee, tests and techniques for selection were available and were used by the military services in setting up selection procedures.

From the beginning the Committee's program has included investigations of criteria for measuring pilot proficiency. The impact of these studies is apparent not only in the operating program of the CAA but also in the work done on criteria by the military services. It appears from the record that the Committee was the first to develop and use the standard flight as a fundamental technique in pilot evaluation. In addition to developing new instruments and techniques, the Committee has conducted research on the evaluation and improvement of procedures commonly used in CAA pilot training programs for the assessment of pilot performance.

Ninety-four technical reports have been prepared for the CAA and twelve for the Office of Naval Research. The scope and variety of these reports cannot be enumerated here, for the reports cover such varied topics as the emotional and physiological reactions associated with flight, studies of airsickness (on which was based the popular pamphlet, *How to Prevent Airsickness*), causes of civil aviation accidents, visual ability and flight performance, studies of fatigue, recognition of the *stall* in a light airplane, and research programming for air traffic control.

A report entitled *Human Engineering for an Effective Air Navigation and Traffic-Control System,* prepared for the Air Navigation Development Board under the auspices of the Committee, was published in March 1951. This report, containing a long-range research plan, is not the work of a single investigator, but the result of a joint effort on the part of psychologists, engineers, and others. Under the direction of Paul M. Fitts, Ohio State University, these investigators combined their scientific and technical resources to review past research, analyze the human problems in air navigation and traffic control, and formulate recommendations with respect to research needs. This report represents the first attempt to formulate a long-range, integrated plan for human engineering research that would parallel and support long-range planning in the design of equipment and systems.

As might be expected, not all the research activities and investments have been productive. In some instances, it was found impossible or impracticable to follow up promising leads; in others, situations beyond control produced inevitable frustrations. Sometimes the research was rewarded with merely negative findings. But even these negative findings have been useful in that they have helped to avoid imposing upon the military services and the CAA costly procedures that would have drained available resources without adequate return.

The operation of the Committee on Aviation Psychology presents a happy example of research supported by Federal agencies and guided by distinguished scientists under a liberal administrative arrangement. Since its organization in 1939, the Committee has distributed several hundred thousand dollars among various research activities. It has pioneered so effectively that aviation psychology is now an established discipline whose importance is recognized in both military and civilian aviation.

On June 30, 1951, Dr. Viteles resigned as chairman of the Committee after nine years of distinguished and energetic service, and Meredith P. Crawford, Vanderbilt University, succeeded him. The results achieved by the Committee, under the chairmanship of Dr. Viteles, were due to the cooperative efforts of scientists, pilots, and administrators utilizing the resources of Government and private agencies in the pursuit of a common purpose—the selection and training of aircraft pilots.

International Council of Scientific Unions

JOHN A. FLEMING

Past President, International Council of Scientific Unions

THE Executive Board of the International Council of Scientific Unions will hold its Annual Meeting at the National Academy of Sciences in Washington in October of this year. Representatives from nine nations will assemble to consider administrative and policy matters associated with the functioning of the international scientific unions. Decisions of importance to the development of international cooperation in science will be made.

In recognition of this special occasion, for it is the first time that the Executive Board has met in the United States, it is appropriate to review, in the pages of NEWS REPORT, the history of this international organization which has contributed so significantly to the promotion of international science. The review will be brief but will attempt to cover the important developments which took place between 1918 and the present. A complete record is contained in a report entitled "A Description of the International Council of Scientific Unions" published by the Council, Gonville and Caius College, Cambridge, England, 1950. This report may be obtained from the General Secretary of the Council.

The benefit to be derived from international contact and association was recognized as early as 1899 with the establishment of the International Association of Academies. However, like many other international organizations, this Association became largely inoperative with the onset of World War I. The neutral countries tried to continue some of the Association's work then in progress, as they did for other international organizations such as those in geodesy and seismology, but their efforts were not entirely successful.

Early in 1918 scientists in France, Great Britain, and the United States began to consider how international scientific cooperation might be resumed on a permanent basis. Groundwork for the resumption of cooperative scientific programs was laid through informal discussions sponsored by the French Academy of Sciences, the Royal Society of London and the National Academy of Sciences of the United States. A first conference was held in London in 1918 attended by representatives delegated by the Academies of all the Allied countries. A second conference held in Paris called for a formal meeting of delegates of the Allied countries to be convened in Brussels in July 1919. This formal conference was the First General Assembly of the International Research Council, which in 1931 was renamed the International Council of Scientific Unions (ICSU).

The Statutes adopted were based fundamentally upon three major responsibilities for international cooperation in science, namely: *a*) organization, coordination, and encouragement among all nations for the maintenance of sound principles; *b*) promotion of scientific endeavor to increase knowledge looking toward application to human welfare—not warfare; and *c*) diffusion of scientific knowledge for increased understanding of all people and general application to human service.

The ten International Unions and their central organization, the International Council of Scientific Unions, have done much in the past three decades to recoup the losses sustained in two world wars and to increase international cooperation in many fields of science. Their records are outstanding in progress toward mutual understanding and resumption among all nations of benefits to everyday human activities derived from coordinated scholarly research. Although the International Council could not carry on fully during World War II, its separate Unions found it possible to continue many of their activities.

Since the end of World War II, the International Council, its Joint Commissions and its Unions have resumed full

operations. The Fourth and Fifth General Assemblies of ICSU were held at London in July 1946 and at Copenhagen in September 1949, respectively—the preceding Assembly had been at London in April 1937. Meanwhile the individual Unions held their first General Assemblies and Congresses after the end of World War II at various cities in Europe and the United States. At all of these gatherings there was a marked resurgence in international scientific interests, coordination of efforts, and constructive endeavors. All parts of the world were represented by official delegates—greater in number than before World War II. This remarkable growth in interest and activity finds evidence in the many proposals for new Unions now being considered by the Executive Board of ICSU and in the fresh approaches taken looking to future development.

There were twelve adhering countries which took part in the First General Assembly of the International Research Council at Brussels in 1919. By 1922 nine of the wartime neutral countries had accepted invitations to adhere, thus raising the total membership of the Council to twenty-one. The ban against the Central Powers was lifted in 1925 and by 1936 there were thirty-eight adhering countries. At present there are some forty-three nations participating in the work of ICSU and its Unions.

The ICSU Unions, as they are frequently called, are as follows: Astronomy, Pure and Applied Chemistry, and Geodesy and Geophysics since 1919; Scientific Radio, Biological Sciences, Pure and Applied Physics, and Geography since 1922; Crystallography, Theoretical and Applied Mechanics, and the History of Science since 1946. There was a Union of Mathematics from 1919 which was discontinued in 1932—this Union is expected to be reestablished in 1952. In 1949 the ICSU Unions were classified as either General or Specialized. Those unions covering several disciplines or containing several Sections of International Associations were classified as General, while those devoted to one fairly well defined field were classified as Specialized.

The activities of some of the scientific Unions are so diverse that it has been found necessary to establish separate commissions and committees to handle specific programs. Similarly it has been found desirable to form mixed or joint commissions to deal with overlapping interests in the domains of two or more Unions. Because of the extent of the fields of some of the Unions, subdivisions in the form of associations or sections have been created. For example, the Union of Biological Sciences has sections on biometry, botany, experimental cytology, entomology, embryology, genetics, limnology, microbiology, and zoology. The Union of Geodesy and Geophysics has autonomous associations for geodesy, seismology, meteorology, terrestrial magnetism and electricity, physical oceanography, vulcanology, and scientific hydrology.

Under the authority of the General Assembly, the work of the Council is directed by a Bureau and Executive Board. The Bureau, consisting of seven persons, is elected by the General Assembly. It includes the President, two Vice Presidents, the Secretary-General, two members-at-large and the retiring President. The Bureau may fill by co-optation any vacancy occurring among its members. The Executive Board of twenty-two consists of the members of the Bureau, together with representatives of the Unions, namely, two members elected from each of the five General Unions, and one member elected from each of the five Specialized Unions. The Executive Board meets annually, unless convoked by special decision of the Bureau.

Through its regular publications, the International Council of Scientific Unions keeps the membership of its constituent Unions and the scientific profession at large informed of developments in international science. Although ICSU publications have never received wide circulation, they have reached the leading national and international scientific organizations and many individual scientists throughout the world. It is fair to say that the publications of ICSU and those of its Unions have increased significantly the effective international exchange of scientific information and encouraged international collaboration in scientific investigations.

In concluding this brief historical sketch of the International Council of Scientific Unions, it may be appropriate to quote from the Statutes of the Council originally adopted in Brussels in 1919 and revised most recently in Copenhagen in 1949. According to these Statutes ICSU has two chief objects, namely "to coordinate and facilitate the activities of the International Scientific Unions in the field of the natural sciences; and to act as a coordinating center for the national organizations adhering to the Council. Further objects of the Council are: *a*) to encourage international scientific activity in subjects which do not fall within the purview of any existing international organizations; *b*) to enter, through the national adhering organizations, into relations with the governments of the countries adhering to the Council in order to promote scientific investigation in these countries; *c*) to maintain relations with the United Nations and its Specialized Agencies; *d*) to make such contacts and mutual arrangements as are deemed necessary with other international councils or unions, where common interests exist in the field of the natural sciences covered by the Council."

To establish and maintain relations with the United Nations and its Specialized Agencies, called for under *c* above, the International Council of Scientific Unions and the United Nations Educational, Scientific and Cultural Organization (UNESCO) have entered into an agreement which provides for mutual consideration of all matters coming within the realm of their common interests. Because of the importance of international cooperation in science and the need for free exchange of scientific information, "UNESCO will endeavor to facilitate, either directly or through its Member States, the movement across frontiers of scientific persons attending conferences or symposia held under the auspices of the Unions or Joint Commissions appointed by the Unions." Of equal importance to the promotion of international cooperation in scientific activities is the provision in the agreement which states that UNESCO will "consider granting such financial support as may be required to enable ICSU to develop its program adequately." To date the grants-in-aid provided by UNESCO have permitted ICSU and its Unions to carry forward numerous international projects and to perform many useful functions.

It has taken more than 30 years of effort, impeded by two world wars, to arrive at the present level of international scientific cooperation, represented by ICSU and its constituent Unions. The achievements are rewarding, yet the future holds even greater promise of significant accomplishment.

SCIENCE NEWS

AUTUMN MEETING NATIONAL ACADEMY OF SCIENCES

The National Academy of Sciences will hold its Autumn Meeting at Yale University November 5–7. Titles of papers already received hold promise of a full and interesting program for the scientific sessions, open to the public, scheduled for Monday, Tuesday, and Wednesday mornings. On Monday afternoon the Academy will hold a business meeting for members only.

Francis O. Schmitt, Professor of Biology and head of the Department of Biology at the Massachusetts Institute of Technology, and a member of the National Academy of Sciences, has been invited to deliver the Monday evening public lecture. The title of Dr. Schmitt's lecture has been announced as "The Micro-Structure of Living Cells and Their Constituents."

Alfred Whitney Griswold, President of Yale University, will speak at the Academy dinner on Tuesday evening, at which time the Marcellus Hartley Award, established to give recognition to individuals who have performed unusual public service through the application of the methods and techniques of science and technology, will be presented to David E. Lilienthal. Mr. Lilienthal is being honored for his work as

Chairman of the Atomic Energy Commission, for his services in preparing an atomic energy program for consideration by the United Nations, and for his wise leadership in establishing a new type of government enterprise aimed to bring products of science and technology in this field to the service of the nation in war and in peace.

Arrangements for the Autumn Meeting have been handled by a Committee on Arrangements headed by E. W. Sinnott, Dean of the Graduate School, Yale University. Other members of the Committee were C. O. Dunbar, R. G. Harrison, G. Evelyn Hutchinson, D. F. Jones, Walter R. Miles, and J. R. Paul, all members of the Academy located in New Haven. A. Wetmore, Home Secretary of the Academy, served as *ex officio* member of the Committee.

INDIAN SCIENTIST GUEST OF THE NATIONAL ACADEMY

The President of the National Academy of Sciences was host at a dinner held at the Cosmos Club on September 29, in honor of Sir Shanti Swarup Bhatnagar, O.B.E., Secretary of the Ministry of Natural Resources and Scientific Research of the Government of India. Dr. Bhatnagar was in the United States to attend the XIIth Congress of the International Union of Pure and Applied Chemistry and to participate in the scientific programs commemorating the fiftieth anniversary of the National Bureau of Standards. Guests at the dinner included scientists from the Washington area.

LECTURE SERIES INAUGURATED

Prominent scientists from the United States and abroad will be invited to lecture at the National Academy of Sciences–National Research Council during the coming fall and winter. These lectures will be open to the scientific public. They will be scheduled at four o'clock in the afternoon and will be followed by an informal reception at which tea will be served.

On September 17, D. C. Martin, Assistant Secretary of the Royal Society of London, gave a lecture on "The Royal Society and Science in Britain."

On September 25, Edward U. Condon, retiring Director of the National Bureau of Standards, and Director-elect of Research and Development at the Corning Glass Works, spoke on "Some Thoughts on Science in the Federal Government."

In response to numerous requests for copies of the lectures presented in the new series, arrangements are being made for their publication. Procedures for obtaining copies will be announced in NEWS REPORT.

EXECUTIVE ASSISTANT APPOINTED

Robert B. Livingston has been appointed Executive Assistant to the President of the National Academy of Sciences. Dr. Livingston, who is on leave from his teaching duties at Yale University School of Medicine, received his A.B. degree from Stanford University in 1940 and his M.D. from the same institution in 1944.

Upon completion of his work at Stanford University, Dr. Livingston served with the Navy Medical Corps in Okinawa and China. At the close of World War II he became an Instructor at Yale University School of Medicine. In 1948, he resigned his instructorship to accept a National Research Council Senior Fellowship for study abroad.

Upon returning to the United States in 1950, Dr. Livingston became Assistant Professor of Physiology at Yale University School of Medicine, where, since November 1950, he has also served as Director of the Aeromedical Research Unit for the Office of Naval Research.

SUPPORT FOR CANCER RESEARCH

The American Cancer Society recently advised the National Research Council that it had allocated $2,000,000 to support cancer research projects, fellowships and scholarships in 1951–1952. This represents an increase of $110,000 over the amount made available last year. The Committee on Growth of the Division of Medical Sciences, NRC, has been asked to recommend the institutions and individuals to receive grants under this program.

NEW RESEARCH COUNCIL CHAIRMAN

The appointment of William W. Rubey, Research Geologist of the U. S. Geological Survey, as Chairman of the National Research Council of the National Academy of Sciences has been announced by Detlev W. Bronk, President of the Academy. Mr. Rubey assumed his duties on the first of October, succeeding Douglas Whitaker who has returned to Stanford University as Dean of Humanities and Sciences on the completion of his term as Chairman of the Council.

The chairmanship of the Council is one in a series of honors that Mr. Rubey has received, in recognition of his scientific attainments and his outstanding ability as organizer and administrator. He served as Chairman of the Division of Geology and Geography of the National Research Council from 1943 to 1946; President of the Geologist Society of America in 1949–1950; President of the Geological Society of Washington in 1948; Vice-President of the Washington Academy of Science from 1947 to 1949; and Distinguished Lecturer for the American Association of Petroleum Geologists in 1950. In 1945 he was elected to membership in the National Academy of Sciences.

Among Mr. Rubey's better known contributions in the field of geology is his work on the Phosphoria formations in western Wyoming. As a result of his thorough stratigraphic studies of this area, rich Vanadium deposits have been found which are of strategic importance to this nation.

NUCLEAR SCIENCE

The following appointments to subcommittees of the Committee on Nuclear Science have been announced by the Division of Physical Sciences:

Subcommittee on Nuclear Constants: Truman P. Kohman, Carnegie Institute of Technology, *Chairman;* Lloyd G. Elliott, National Research Council of Canada; Gerhart Friedlander, Brookhaven National Laboratory; Alfred O. Nier, University of Minnesota; Henry E. Duckworth, McMaster University, Ontario; Isadore Perlman, University of California, Berkeley; Katherine Way, National Bureau of Standards; and Ward Whaling, California Institute of Technology.

Subcommittee on Penetration of Charged Particles in Matter: Samuel K. Allison, University of Chicago.

Subcommittee on Neutron Measurements and Standards: Louis A. Turner, Argonne National Laboratory.

ALASKAN SCIENCE CONFERENCE

More than two hundred scientists from Alaska, Canada, and the United States participated in the Second Alaskan Science Conference held at Mt. McKinley National Park, Alaska, September 4–8. The National Academy of Sciences–National Research Council and the Arctic Institute of North America assisted in planning the Conference, which was sponsored by the University of Alaska and the newly created Alaska Division of the AAAS. The Honorable Ernest Gruening, Governor of Alaska, and Chairman of the conference, presided at the opening session, and presented an address on "The Political Ecology of Alaska." A total of 93 papers dealing with specific phases of Alaskan research were presented during the three joint sessions and the eight section meetings, which covered a variety of fields, including agriculture, forestry, mining, wildlife, oceanography, sociology, public health, geophysics, education, anthropology, physiology, and geology.

Kirtley F. Mather, President of the American Association for the Advancement of Science, also addressed the opening session, officially installing the newly organized Alaska Division. Memberships in the Alaska Division now total approximately one hundred. At its first business meeting, the Alaska Division formally adopted a Constitution and Bylaws, and elected the following officers, all of whom are connected with the United States Public Health Service: *President,* Laurence Irving, Anchorage; *Vice President,* Charles W. Wilson, Palmer; *Secretary-Treasurer,* Rachel S. Simmet, Anchorage.

SCIENCE ATTACHÉS

Seven United States scientists have been appointed by the Department of State to serve in overseas posts as Science Attachés in embassies and legations in London, Stockholm, and Bern. These appointments represent progress in the implementation of recommendations contained in the report entitled *Science and Foreign Relations* prepared in 1950 under the direction of Lloyd V. Berkner, Consultant to the Secretary of State and, at that time, a member of the staff of the Department of Terrestrial Magnetism, Carnegie Institution of Washington.

Hans T. Clarke, a member of the National Academy of Sciences, and former Head of the Department of Biochemistry at Columbia University, has assumed the post of Science Attaché at the United States Embassy in London. He succeeds Charles S. Piggott, also a member of the National Academy, who returned to this country in August following completion of a two-year assignment to the London post. Dr. Clarke will be assisted by L. H. Farinholt and Arthur S. Osborne. Dr. Farinholt was Professor of Chemistry at Columbia University, prior to his appointment to the science staff in London. During World War II he was Executive Officer of the Carnegie Institute of Technology Explosives Research Laboratory under the Office of Scientific Research and Development. Dr. Osborne is well known for his work in the public health aspects of medicine and surgery. He joined the science staff in London in February 1950.

William L. Doyle and Robert L. Loftness have been appointed to the staff of the United States Embassy in Stockholm. Dr. Doyle was formerly a Professor of Anatomy at the University of Chicago, and during World War II was Director of the Office of Scientific Research and Development at the University of Chicago. Dr. Loftness, who is a chemical engineer, received his training at the University of Washington and abroad, and has been affiliated with an industrial firm on the west coast.

Lodewyk Lek and Gordon F. Hull are serving in the Legation at Bern. Dr. Lek, until his appointment to Switzerland, was on the staff of the Scripps Institute of Oceanography, La Jolla, California. Dr. Hull was Professor of Physics at Dartmouth College and a wartime consultant for the Office of Scientific Research and Development.

These seven appointments mark the beginning of a science attaché program which soon will be extended to other countries in Europe and eventually throughout the world.

LIAISON REPRESENTATIVE APPOINTED

Brigadier General Leslie E. Simon has recently been appointed Liaison Representative of the Division of Ordnance Research and Development, Department of the Army, in the Division of Mathematics of the National Research Council.

General Simon was the Director of the Army Ordnance Corps Ballistic Research Laboratories at Aberdeen, Maryland, during the last war. A native of Tennessee, he was graduated from the U. S. Military Academy in 1924. He has since become a nationally recognized authority in statistical analysis as applied to the control of the quality of manufactured articles. He is a Shewhart Medalist and the author of a leading manual on the application of statistical methods. Under his administrative guidance the Ballistic Research Laboratories developed a supersonic wind tunnel which played an essential role in the design of bombs, projectiles and rockets for World War II, and is now being used to obtain data required in the design of the missiles of the future.

General Simon was selected to calibrate and sort the vast quantity of ammunition that had been stockpiled in England for the attack on the Normandy coast, a work which gained for him the award of the Legion of Merit. Following V–E Day, General Simon was again sent to the European Theater to study the methods and products of research developed during the war in Germany. His recent book, *German Research in World War II,* presents the results of these investigations.

PACIFIC SCIENCE BOARD

Harold J. Coolidge, Executive Director of the Pacific Science Board, attended a two weeks' conference of specialists on filariasis and elephantiasis held under the auspices of the South Pacific Commission in Papeete, Tahiti, in August. This conference defined various problems raised by the prevalence of these diseases, especially in the South Pacific area and recommended a program of future research, as well as appropriate control measures.

The United States delegation to the Conference included W. H. Wright, National Institutes of Health, John F. Kessel, Filariasis Foundation, University of Southern California, Stephen M. K. Hu, Board of Health, Territory of Hawaii, Lt. Leo A. Jachowski, U. S. Navy, R. I. Hewitt, American Cyanamid Company, and D. Lehine, Administration of American Samoa. Specialists also came from New Caledonia, Indo-China, Fiji, Australia, New Zealand, and Raratonga.

Following the Conference, Mr. Coolidge went to Suva where he visited several of the farms which are conducting experiments in crop growing and animal feeding under tropical conditions. He also visited the Central Medical School which is currently training 56 medical and public health students from the Trust Territory, American Samoa, and islands of the South Pacific.

DIRECTORY OF GEOLOGY DEPARTMENTS

The American Geological Institute will publish early in November a Directory of Geology Departments in the United States and Canada. Departments in related fields such as Geophysics and Fuel Resources also will be included. The first directory of this type was published by the American Association of Petroleum Geologists in 1949.

Information concerning departmental staffs, courses and degrees offered and academic requirements for degrees will be included for each institution listed. It is anticipated that the Directory will be corrected and reissued annually early in each academic year.

COMMITTEE ON ARTIFICIAL LIMBS

A. Bennett Wilson, Jr., who has been Administrative Assistant to General F. S. Strong, Executive Director of the National Research Council Advisory Committee on Artificial Limbs, has been appointed Executive Secretary of this committee.

Mr. Wilson graduated from the University of Virginia in 1941, and shortly thereafter joined the U. S. Army Air Force for service in the South Pacific. Subsequently, he was employed by the Republic Aircraft Corporation and Trans World Airlines. He joined the staff of the Advisory Committee on Artificial Limbs in May 1949.

TRUCK TRAFFIC ROAD TEST

Negotiations have been completed between the Western Association of State Highway Officials and the Highway Research Board of the National Research Council whereby the Board will conduct the second of a series of researches into relationships between various pavement designs and their ability to carry heavy truck traffic. The test project will be on a section of road relocation about ten miles south of Malad City in southern Idaho. The test lanes will be 1.4 miles long. The road will be built under carefully controlled conditions this fall and next spring, and testing under specific truck traffic will be started late next summer. The pavement will consist of a granular base with asphaltic concrete surface.

Participating in this cooperative project are the highway departments of California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming; the Bureau of Public Roads, the Automobile Manufacturers Association, and the Petroleum Industry.

Details as to test procedures are being worked out and will be reported in an early issue of the NEWS REPORT.

COMMITTEE ON ASTRONOMY

Nicholas U. Mayall of the Lick Observatory and G. M. Clemence of the U. S. Naval Observatory have been appointed members of the Committee on Astronomy, Advisory to the Office of Naval Research. Both men will serve for three years.

INTERNATIONAL RELATIONS

SCIENTIFIC UNIONS

ICSU

The Executive Board of the International Council of Scientific Unions will meet at the National Academy of Sciences–National Research Council October 15–19. The five-day meeting will be devoted to consideration of problems pertaining to the work of the International Council and its ten constituent international Unions. By invitation of the President and General Secretary of ICSU, the Chairmen of United States National Committees of the international scientific unions will attend the meeting as official observers.

On Thursday, October 18, members of the Executive Board and invited speakers from the United States and Canada will take part in a general symposium entitled Development of International Cooperation in Science. This program will be held in the Academy–Council auditorium and will be open to the scientific public.

The morning session will include talks by F. J. M. Stratton, General Secretary of ICSU, on "The Past Development of International Cooperation in Science," W. A. Noyes, Jr., Chairman of the Division of Chemistry and Chemical Technology, NRC, on "International Scientific Joint Ventures," and J. N. Mukherjee, Member of the Bureau of ICSU, on "Development of International Cooperation in Science from the Point of View of Asia and the Far East."

The afternoon session will open with a talk by C. J. Mackenzie, President, National Research Council of Canada, on "A Canadian View on International Scientific Cooperation." Joseph B. Koepfli, Science Adviser, United States Department of State, will speak on "Science and Foreign Relations" and Alexander von Muralt, President of ICSU, will speak on "National and International Aspects of Science." William W. Rubey, Chairman of the National Research Council, will preside at the Symposium.

Members of the Executive Board will be guests on October 16 at a luncheon by the Honorable James E. Webb, Under Secretary of State. That evening the President and Council of the National Academy of Sciences will be hosts at a dinner for the Board members and participants in the Symposium. A reception and buffet supper at the home of the Executive Secretary of the Division of International Relations will be held on October 17.

IAU

The Executive Committee of the International Astronomical Union met in Paris September 4–6. Otto Struve, Chairman of the Department of Astronomy at the University of California, and a vice president of the Union, represented the United States. The Committee voted to accept an invitation extended by G. Abetti, a vice president of the Union from Italy, to hold its next General Assembly in Rome in September, 1952. Several committees were formed to arrange for symposia to be held at the Rome meeting. Among topics tentatively favored were Stellar Evolution and Astrometric Problems of Faint Stars.

IUGG

The Ninth General Assembly of the International Union of Geodesy and Geophysics was held at the Free University of Brussels from August 21 to September 1. Nearly 700 delegates and over 200 guests were present from 43 countries. The United States was represented by an official delegation of ten scientists headed by Walter H. Bucher, President of the American Geophysical Union. The total United States representation exceeded 120 persons.

The field of interest of the International Association of Seismology, one of the seven constituent associations of the Union, was

broadened to include the work of the Committee on the Physics of the Earth's Interior, established in 1936 by action of the Union. At the Brussels Assembly the Association of Seismology was renamed the Association of Seismology and the Physics of the Earth's Interior. This action was taken in lieu of establishing an eighth international Association.

The results of elections conducted during the week of meetings in Brussels were announced at the closing Plenary Session of the Union. Officers elected for the three-year period ending in 1954 included the following:

IUGG: *President,* Sydney Chapman (Great Britain); *Vice Presidents,* J. A. B. Bjerknes (U.S.A.) and Gino Cassinis (Italy); *General Secretary,* G. Laclavere (France). **Finance Committee:** *Chairman,* J. Tuzo Wilson (Canada); *Secretary,* K. Hilding Beij (U.S.A.); Gerardo Dianderas (Peru); A. T. Dodson (Great Britain); and Jean Vignal (France).

Geodesy: *President,* C. F. Baeschlin (Switzerland); *Vice Presidents,* J. de Graaf-Hunter (Great Britain); and Gino Cassinis (Italy); *Secretary,* P. Tardi (France).

Seismology and the Physics of the Earth's Interior: *President,* Beno Gutenberg (U.S.A.); *Vice Presidents,* Harold Jeffreys (Great Britain) and Pietro Caloi (Italy); *Secretary,* Jean-Pierre Rothe (France).

Meteorology: *President,* K. R. Ramanathan (India); *Vice Presidents,* C. G. Rossby (U.S.A.) and P. Queney (France); *Secretary,* Jacques van Mieghem (Belgium).

Terrestrial Magnetism and Electricity: *President,* Jean Coulomb (France); *Vice Presidents,* J. Bartels (Germany) and Sydney Chapman (Great Britain); *Secretary,* V. Laursen (Denmark).

Oceanography: *President,* J. Proudman (Great Britain); *Vice Presidents,* C. O'D. Iselin (U.S.A.) and J. Rouch (France); *Secretary,* H. Mosby (Norway); *Deputy Secretary,* R. H. Fleming (U.S.A.).

Volcanology: *President,* B. G. Escher (Netherlands); *Vice Presidents,* L. Glangeaud (France) and Jean Verhoogen (Belgium and U.S.A.); *Secretary,* F. Signore (Italy).

Hydrology: *President,* J. Th. Thijsee (Netherlands); *Vice Presidents,* Giulio de Marchi (Italy) and A. N. Khosla (India); *Secretary,* Leon Tison (Belgium).

The Tenth General Assembly of the Union will be held in Italy in 1954. Plans for this meeting will be announced in a subsequent issue of NEWS REPORT.

IMU

The National Academy of Sciences–National Research Council has formally requested that the United States be admitted as a charter member of the new International Mathematical Union. The Academy–Council request was made on behalf of the mathematicians of the United States who actively participated in formulating plans for the new Union.

In compliance with Article II of the Statutes of the Unions, the Chairman of the National Research Council has established a National Committee for Mathematics composed of eminent mathematicians representing all phases of mathematical science in the United States. Five members of this committee were selected from nominations submitted by the Policy Committee of the four mathematical societies. Four members were selected from nominations made by the Division of Mathematics of the National Research Council. This nine-man committee, with the following membership, will represent the mathematicians of the United States in all matters relating to this country's participation in the Union: Marshall Stone, University of Chicago, *Chairman;* Einar Hille, Yale University; J. R. Kline, University of Pennsylvania; Rudolf Langer, University of Wisconsin; Saunders Mac Lane, University of Chicago; Marston Morse and John von Neumann, Institute for Advanced Study, Princeton, N. J.; J. B. Rosser, Cornell University; and Samuel S. Wilks, Princeton University.

IUPAC

The National Academy of Sciences–National Research Council, which adheres to the International Union of Pure and Applied Chemistry on behalf of the government and chemists of the United States, joined with the American Chemical Society in welcoming the chemists of the world to the XVIth Conference of the Union and XIIth Congress of chemistry recently held in New York City and Washington. Attendance at the international meetings which were held in conjunction with the

Diamond Jubilee of the American Chemical Society, exceeded six thousand. Over 600 chemists from outside the United States, representing 36 different countries, registered as members of the Congress and presented scientific papers.

The official delegates to the XVIth Conference of the Union approved the formation of the following six new Sections of the Union: Inorganic Chemistry; Physical Chemistry; Analytical Chemistry; Biochemistry; Organic Chemistry; and Industrial Chemistry.

Among other items of business acted upon by the Council of the Union were the admission of new member countries, selection of the next conference site and election of officers. The following new members were admitted: Western Germany (subject to the formation of a federation of chemical societies in that country); Japan; and New Zealand. Stockholm was selected as the location of the next conference to be held in 1953. The following members of the Bureau, the governing body of the Union, were elected to serve for the next two years:

President, Prof. Arne Tiselius (Sweden); *Secretary-General*, Prof. Raymond Delaby (France); *Treasurer*, L. H. Lampitt (Great Britain).

Section Vice Presidents: E. W. R. Steacie (Canada), **Physical Chemistry**; Pierre Jolibois (France), **Inorganic Chemistry**; P. Karrer (Switzerland, **Organic Chemistry**; E. C. Dodds (England), **Biological Chemistry**; C. J. Van Nieuwenburg (Netherlands), **Analytical Chemistry**; and L. H. Lampitt (Great Britain), **Applied Chemistry.**

Elected Vice Presidents: Roger Adams (U.S.A.); E. Berner (Norway); and A. Stoll (Switzerland).

Past Presidents: M. T. Bogert (U.S.A.); and H. R. Kruyt (Netherlands).

Members: J. Ancizor-Sordo (Colombia); G. Chaudron (France); H. M. Melville (Great Britain); A. Nasini (Italy); K. Venkataraman (India); and E. Volwiler (U.S.A.).

At the conclusion of the meetings in New York City the Conference of the Union moved to Washington, where it held sessions at the Academy–Council and at the National Bureau of Standards. On the evening of September 14 Conference delegates and their wives were guests at the Joint Banquet of the International Union and the National Bureau of Standards held under the auspices of the National Academy of Sciences. On this occasion the President of the National Academy presided and the Honorable Charles Sawyer, Secretary of Commerce, addressed the group.

IUCr

The U. S. A. National Committee for Crystallography under the auspices of the National Research Council is seeking contributions in support of the publication program of the International Union of Crystallography. The publications, started as replacements for wartime casualties, include *Acta Crystallographica*, a journal now in Volume IV, *Structure Reports*, an annual critical review of all published work in the field of crystallography and x-ray and electron diffraction; and *International Tables for X-ray Crystallography*, a compilation of physical and mathematical data required for x-ray diffraction analysis.

The existence of a strong and progressive publication program is essential to the users of x-ray and electron diffraction methods for determining crystal and molecular structures and for identifying crystalline phases in the fields of metallurgy, ceramics, corrosion and other surface reactions, catalysis, heavy chemical production and many others.

Most of the support for the publication program prior to 1951 came from British sources. A contribution of about $35,000 from the United States is being sought to provide the additional funds needed to place these publications on a self-supporting basis. Professor L. O. Brockway, of the Department of Chemistry at the University of Michigan, is Chairman of the fund-raising committee.

COMMITTEE ON UNESCO

The Committee on UNESCO of the Division of International Relations, National Research Council, will meet October 8 and 9 in the Academy–Council building. Maurice B. Visscher, Chairman of the Committee and Professor of Physiology at the University of Minnesota, will preside. In its two-day meeting, the Committee will

discuss the natural science programs of UNESCO and their implementation. The Third National Conference to be held in January 1952 and the technical assistance programs will be considered the second day of the meeting.

CONFERENCE ON DOCUMENTATION

The Eighteenth International Conference on Documentation was held in Rome, Italy, September 15–21. Milton O. Lee, Executive Secretary of the Division of Biology and Agriculture of the National Research Council, was Chairman of the United States delegation appointed by the Secretary of State. Other delegates were: Lt. Col. Robert E. Huneycutt, Department of the Army; Eugene Power, University Microfilm Company; Fremont Rider, Wesleyan University; Julian Smith, Department of the Navy; William E. Story, Jr., Department of Defense; and Harry R. Stritman, United States Embassy, Rome.

SCIENTIFIC PERSONNEL

MERCK FELLOWSHIPS

The Merck Postdoctoral Fellowships in the Natural Sciences, supported by funds provided by Merck and Company, are offered to young men and women who have demonstrated marked ability to conduct research in chemical or biological science and who wish to broaden their fields of investigation. All fields of chemistry and biology, including the pre-clinical medical sciences, are open to applicants. Recognizing that many scientific problems in these fields are of such complexity that a thorough grasp of more than one discipline is required for satisfactory approach toward their solution, special consideration will be given to those applicants who wish to supplement mastery in one field by competence in another. Fellowship awards are made for study and research in this country or abroad.

Fellowships are open to citizens of the United States, under 35 years of age, who have received training in chemistry or biology equivalent to that represented by the Ph.D. degree and who have demonstrated unusual talent for experimental research. These fellowships will be awarded by the Merck Fellowship Board at its annual meeting held in March. Applications must be filed before January 1, 1952, and tenure may begin at any appropriate time after the award has been made.

FELLOWSHIP IN AERONAUTICS

Hugh G. Gundel, a graduate student at the University of Michigan, has been awarded a Predoctoral Fellowship in Aeronautics for study abroad. Mr. Gundel will pursue his fellowship studies at the Royal Institute of Technology in Stockholm, Sweden. This appointment represents the tenth award granted by the National Research Council for study abroad in the field of aeronautics for the year 1951–1952.

STAFF APPOINTMENT

Trusten W. Russell has been appointed assistant to Francis A. Young, Executive Secretary of the Committee on International Exchange of Persons of the Conference Board of Associated Research Councils. The National Research Council shares responsibility with the Social Science Research Council, the American Council on Education, and the American Council of Learned Societies in recommending candidates for awards for university lecturing and postdoctoral research abroad under the Fulbright program.

Dr. Russell, who received his Ph.D. degree in French from Columbia University in 1946, was a member of the faculty at Princeton University from 1945 until 1948. From 1948 until 1950 he was Dean of Emerson College, Boston, Massachusetts.

RCA FELLOWSHIPS

The RCA Predoctoral Fellowships in Electronics, sponsored by the Radio Corporation of America, are designed to provide special graduate training and experience to young men and women who have demonstrated marked ability in the general field of electronics, considered either as a branch of electrical engineering or as a part of the field of physics. Applicants must be citizens of the United States, have demonstrated ability and aptitude for advanced work and have received training in electronics equivalent to that represented by one year beyond the bachelor's degree in a university of recognized merit in this field.

Fellowships are awarded by the RCA Fellowship Board at a meeting which is usually convened in March. Applications must be filed in the Fellowship Office before January 10, 1952. Unless otherwise arranged, tenure of these Fellowships begins in September of the year of appointment.

CANCER RESEARCH SCHOLARS

The Committee on Growth, Division of Medical Sciences, is assisting the American Cancer Society in the selection of institutions to participate in the program of Grants for Scholars in Cancer Research. Applications are accepted from institutions only, each of which may nominate one individual. The approved institution receives $6,000 per year for three years to support the work of a newly trained investigator in cancer research. Applications, which are available from the Executive Secretary, Committee on Growth, should be submitted prior to January 1, 1952.

AFFILIATED SOCIETIES

This Department of NEWS REPORT is reserved for announcement of annual meetings, research programs, and other activities of societies which are affiliated with the NRC.

NEW AFFILIATED SOCIETIES

The following specialized mathematical organizations have affiliated with the recently created Division of Mathematics of the National Research Council: Econometric Society; Association for Symbolic Logic; Biometric Society; and American Physical Society. Representatives of the four organizations will serve as members of the Division.

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

The American Institute of Biological Sciences, made up of many separate biological societies, sponsored its second September campus meeting at the University of Minnesota, September 9–12.

Societies participating in the meeting were the American Society for Horticultural Science, American Society of Human Genetics, the American Society of Plant Physiologists, the Botanical Society of America, and the Ecological Society of America. By invitation, the American Bryological Society, American Society of Naturalists, American Society of Plant Taxonomists, and the Society for Industrial Microbiology also participated.

Alan T. Waterman, Director of the National Science Foundation, gave the keynote address, speaking on "Federal Support of Fundamental Research in the Biological Sciences." More than 1,000 society members present heard Dr. Waterman outline the future plans of the National Science Foundation. Dr. Waterman's address will appear in the October issue of *The AIBS Bulletin.*

AMERICAN MATHEMATICAL SOCIETY

The 56th Summer Meeting of the American Mathematical Society was held at the University of Minnesota, September 4–7, with an attendance of around 500. Two invited addresses and over 70 research papers were presented. Professor Deane Montgomery, of the Institute for Advanced Study, presented the 32nd Colloquium Lec-

ture, his topic being "Topological Transformation Groups."

Other meetings of the Society for the present academic year are:

1951	
October 27	*Washington, D. C.*
November 23–24	*Auburn, Ala.*
November 23–24	*Norman, Okla.*
December 1	*Pasadena, Calif.*
December 26–28 (Annual Meeting)	*Providence, R. I.*
1952	
February 23	*New York City*
April 25–26	*New York City*
April 25–26	*Chicago, Ill.*
May 3	*Fresno, Calif.*
June 21	*Eugene, Ore.*
September 3–6 (Summer Meeting)	*East Lansing, Mich.*

The Fifth Applied Mathematics Symposium will be held at the Carnegie Institute of Technology on June 16 and 17, 1952. The national headquarters of the Society has moved from New York City to 80 Waterman Street, Providence, Rhode Island.

ASSOCIATION OF AMERICAN PHYSICIANS

Arthur L. Bloomfield, Professor of Medicine, Stanford University School of Medicine, has been selected by the Association of American Physicians to deliver the Kober Lecture at Gaston Hall, Georgetown University School of Medicine, Washington, D. C., on May 1, 1952.

AMERICAN GEOGRAPHICAL SOCIETY

The Centennial Year of the American Geographical Society in 1952 will be inaugurated with a banquet for Fellows and guests on November 8, at the Hotel Waldorf-Astoria in New York City. Speakers will include Richard U. Light, President; George H. T. Kimble, Director; and Lowell Thomas, who will serve as Toastmaster.

RECORD OF MEETINGS

August

8	Ad Hoc Committee on Penicillin Dentifrice, *Boston, Mass.*
	Executive Committee, Food and Nutrition Board, *New York City*
	Handbook of Biological Data
9	Advisory Committee in Biology
16	Advisory Group on Plumbing for Defense Production Administration Project
21	Advisory Group on Electrical Installations for Defense Production Administration Project
28	Panel on Standardization of Units in Expressing Air Contamination
	Advisory Committee on Heating and Ventilating for Defense Production Administration Project
29	Ad Hoc Conference on Radioactive Dextran

September

4	Titanium Panel Subcommittee
6	Advisory Committee on Off-street Parking
6–7	American Society for Metals and Metallurgical Advisory Board Committee on Naval Diesels
7–8	Committee on Economic Geography, *Evanston, Ill.*
8	Pesticide Subcommittee
10	Manganese Panel Subcommittee
11	Highway Research Board Joint Conference on Proposed Road Tests
13	Plant Sciences Subcommittee, *Lansing, Mich.*
14	Upper Extremity Technical Committee, *Los Angeles, Calif.*
	Committee on Economics of Motor Vehicle Size and Weight
15	Lower Extremity Technical Committee, *Los Angeles, Calif.*
18	Electrical Installations Advisory Group, Defense Production Administration Project
19	Subcommittee on Food Supply
	Subcommittee on Waste Disposal
20	Committee on Sanitary Engineering and Environment
	Titanium Panel Subcommittee
21	Technical Military Advisory Group Ship Structure Committee
	Special Committee, Joint Conference on Proposed Road Tests
24	Committee on Atomic Casualties
25	Executive Committee, Building Research Advisory Board
26	Subcommittee on Shock
	Advisory Group on Plumbing for Defense Production Administration Project
	Special Committee, Joint Conference on Proposed Road Tests
27	Preservation of Optical Equipment
	Prevention of Deterioration Center
27–28	Operations Research Executive Committee, *Urbana, Ill.*
28	Subcommittee on Sterilization of Blood and Blood Plasma

THE CALENDAR

The following Academy–Research Council meetings will be held in Washington unless otherwise indicated. Attendance is restricted to members and invited guests except when meetings are announced as open to the public.

October

1 Special Committee, Joint Conference on Proposed Road Tests
Ad Hoc Conference on Manual Methods of Artificial Respiration
1–2 Nickel Panel
2 Subcommittee on Dermatology
Metallurgical Advisory Board
4 Committee on Globes
Committee on Venereal Diseases
5 Subcommittee on Oncology
Advisory Group on Plumbing for Defense Production Administration Project
Special Committee, Joint Conference on Proposed Road Tests
6 Committee on Surgery
7 Council, National Academy of Sciences and Executive Board, National Research Council
8–9 Committee on UNESCO
9 Committee on Burns
10 Editorial Board, American Institute of Biological Sciences Bulletin
12 Committee on Cancer Diagnosis and Therapy
Subcommittee on Malaria
15 Subcommittee on Cardiovascular Diseases
15–19 Executive Board, International Council of Scientific Unions
16–17 Committee on Food Protection
17 Prevention of Deterioration Center
17–18 Committee on Geography, Advisory to Office of Naval Research
17–19 Pumping Committee, *Springfield, Ill.*
19 Dentistry Subcommittees
Advisory Group on Radiobiology, Defense Production Administration Project
20 Committee on Dentistry
21 Conference of International Cancer Organizations
23 Subcommittee on Infectious Diseases
23–24 Building Research Advisory Board
24 Subcommittee on Endocrinology
25 Subcommittee on Burns
26 Subcommittee on Tuberculosis
Maize Committee
27 Committee on Army Medical Service Graduate School
Subcommittee of Area Chairmen
29 Subcommittee on Sterilization of Blood and Blood Plasma
Executive Committee, Committee on Growth

November

1 Committee on Medicine
5 Ad Hoc Committee on Stress
5–7 National Academy of Sciences, Yale University, *New Haven, Conn.*
9 Committee on Ophthalmology
9–10 Food and Nutrition Board
12 Subcommittee on Orthopedic Surgery
14 Subcommittee on Shock
15 Subcommittee on Nervous System
16 Committee on Psychiatry
Committee on Milk Production, Distribution and Quality
19 Sanitary Engineering Subcommittees
20 Committee on Sanitary Engineering and Environment
23 Committee on Problems of Alcohol
24 Committee on Surgery
24–25 Committee on Animal Nutrition
26 Committee on Hearing
27–28 Building Research Advisory Board Joint Conference on Laboratory Design for Handling Radioactive Materials
29 Committee on Veterans Medical Problems

NEW PUBLICATIONS

Atoll Research Bulletin. The Pacific Science Board. National Research Council, 1951. No. 1, 25 p. No. 2, 14 p.

Land Acquisition and Control of Adjacent Areas. Highway Research Board Bulletin No. 38. National Research Council, 1951. 82 p. $1.20.

Phase Transformations In Solids. Committee on Solids, Division of Physical Sciences. New York: John Wiley & Sons, Inc., 1951. 660 p. $9.50.

Proceedings of the Thirtieth Annual Meeting 1950. Highway Research Board. National Research Council, 1951. 532 p. $7.50.

Roughness and Skid Resistance. Highway Research Board Bulletin No. 37. National Research Council, 1951. 59 p. $0.90.

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